DOCUMENT RESUME

ED 466 798 IR 021 411

AUTHOR	Guhlin, Miguel; Ornelas, Leo; Diem, Richard
TITLE	Methods That Work: Educator Competencies for Technology in Public Schools.
PUB DATE	2002-04-00
NOTE	25p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 1-5, 2002).
PUB TYPE	Reports - Evaluative (142) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	Academic Standards; Certification; *Computer Uses in Education; *Educational Technology; Elementary Secondary Education; *Professional Development; Public Schools; *Teacher Competencies; Teaching Methods; *Technology Integration

ABSTRACT

Recent changes on the part of the Texas State Board of Educator Certification (SBEC) have impacted educator competencies in regards to technology. Doubt remains, however, as to whether more effective professional development strategies are being employed to facilitate increased technology proficiency among educators. A review of the literature reveals several insights into what impacts professional development strategies in regards to educator competencies for technology. The following are discussed in this paper: teacher attitudes; what constitutes successful technology integration; successful professional development strategies; and uses of technology that meet the SBEC Standards in Texas public schools. Common components of school district professional development programs designed to address educator technology competencies include the following: problem-based learning approaches to guide student learning-both for adults and children; development of technology skills that focus on information seeking, management, synthesis and presentation through a variety of formats; and application of these skills in the classroom with students through special summer camps and, later as teachers gain more familiarity, during the school day. The study presented in this paper reviews existing educator technology competency development programs that incorporate these components. Data on different school district educator competency professional development programs were gathered through visits to district Web pages to determine if they had an educator competency development program, electronic mail to the Texas Center for Educator Technology (TCET) for suggestions of exemplary school districts to review, and email requests to school districts for their educator competencies. The paper concludes that, based on this pilot study, few school districts, even those recommended by the Texas Center for Educational Technology, truly take advantage of the wide variety of instructional methods available. (Contains 47 references.) (AEF)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 466 798

Methods that Work: Educator Competencies for Technology in Texas Public Schools

By: Juan Miguel Guhlin & Leo Ornelas & Richard Diem

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

J.M. Guhlin

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

IR021411

Running Head: EDUCATOR COMPETENCIES

Educator Competencies for Technology in Texas Public Schools

Miguel Guhlin

Leo Ornelas

Dr. Richard Diem, Project Advisor

The University of Texas at San Antonio

IR021411

Introduction

Technology innovations have changed professional development methodologies for adult learners. Not only have teacher preparation methods for integrating technology changed, but so have the technologies teachers have access to in the classroom for their students. Teachers need technology-based professional development to shift onto learner-directed instructional methods. The training process should emphasize the specifics of locating information effectively, organizing the relevant information for analysis, and presenting the outcomes of the work in an understandable way (Niederhauser, 1996). With such training, teachers can help students develop cooperative projects that have an interdisciplinary focus. Recent changes on the part of the State Board of Educator Certification (SBEC) have impacted educator competencies in regards to technology (Appendix A). Doubt remains, however, as to whether more effective professional development strategies are being employed to facilitate increased technology proficiency among educators.

Guiding Question

How have technological changes in educator professional development strategies and in public schools impacted the technology competencies for educators in Texas, regardless of content area?

Review of the Literature

A review of the literature reveals several insights into what impacts professional development strategies in regards to educator competencies for technology such as: (a) teacher attitudes towards new technologies being used; (b) what constitutes successful technology integration; (c) what are some professional development strategies to achieve successful

technology integration, such as cohort learning; (d) the new professional development strategies in use or gaining popularity among services that provide training; (e) the educator competencies educators require to successfully participate in training; and (f) examples of required educator technology competencies in Texas Public Schools now.

Teacher Attitudes

Gardener, Discenza, and Dukes (1993) write that computer anxiety is a major reason why teachers resist using technology. It may take at least 30 hours of technology related instruction and practice to reduce anxiety about technology (Beasley & Sutton, 1993). Reducing anxiety is the first step towards impacting teacher's attitudes regarding technology. People over 30 years of age may suffer from cyberphobia, or an aversion or anxiety caused by technology. Anxiety produces reactions involving avoidance of public scrutiny (George et al., 1996). It is important to recognize that the challenge to integrate technology elicits a fear of or anxiety to the technology, not because the technology is difficult to learn but because it may change the existing culture, power structure or habits (George et al., 1996).

Positive attitudes towards computers are positively correlated with teachers' experiences. As teachers become more familiar with computers, their fears tend to decrease and their confidence increases. (Loyd and Gressard, 1986). Anxiety is lessened, while computer confidence is increased, through voluntary use of a computer or ownership (Parish & Necessary, 1996).

A common reason for teachers to have negative attitudes toward technology is the lack of knowledge and experience with the technology (Summers, 1990). Increased knowledge can have a positive impact on teacher attitudes towards technology (Lilliard, 1985). Teachers must possess

positive attitudes and adequate technological skills to successfully integrate technology into the classroom.

Facilitation of real life, problem-based learning has been found to be one instructional method that typifies successful integration of technology into the classroom. Other methods and components teachers use include Internet/probe-based primary data gathering and problem analysis, and the transparent use of information management tools. In the classroom where technology use is transparent, real life problems are addressed that might not have been without the technology.

Bowens (2000) found that increased technology access is believed to translate into (1) increased teacher use of technology for instructional purposes, and (2) changes in teacher attitudes towards using instructional methods that involve technology in the classroom. In today's standards-focused, high stakes testing educational environment ascertaining the veracity of teachers' perception to technology is critical.

Yet, increased technology access does not necessarily result in increased teacher use of technology for instructional purposes. Clark (cited in Shaver, 1998) state that there is no compelling evidence in the past 70 years of published and unpublished research that media causes learning under any conditions. Shaver goes on to say that while methods of delivery may influence the cost, the efficiency, or the extent of distribution of learning, it is the content, including instructional methods that influence student achievement. Many teachers find themselves bewildered by the changing media, such as software and web sites. Panel as cited in Shaver (1998) writes that teachers must first identify, evaluate different media, then decide how each fits into the curriculum. Teachers also must learn how to organize classroom activities so that the technology is an integral part of instruction.

What Constitutes Successful Technology Integration

How learning occurs may be a starting point for identifying how instructional methods that employ technology can be integral to the process of teaching and learning. Several views exist on how learning occurs.

Learning is promoted when students pursue individual interests, when they build on prior knowledge, and when they engage in hands-on and authentic creativity (Nicaise & Crane, 1999). Teachers structure most courses to transmit knowledge where they can have tight control over pedagogy. As Perkins (as cited by Nicaise & Crane, 1999) points out, they do this by predetermining all or most learning objectives, then constructing lesson plans to deliver or impart fragmented content across several weeks or months. Teachers plan their objectives first, then choose instructional activities related to those objectives. After choosing activities, teachers implement those activities in an appropriate sequence, and then evaluate student attainment of the desired objectives (Young, Reiser, & Dick, 1998).

Constructivist theorists believe that learning is an active process where students literally build or construct an understanding by creating personally meaningful products (Nicaise & Crane, 1999). Some of the characteristics of constructivist classrooms include: Emphasis on big concepts, pursuit of student questions, reliance on primary sources of data and manipulative materials, and cooperative grouping. The role of the teacher in the constructivist classroom is that of facilitator, publisher of student views, and assessor of student exhibitions and portfolios (Brooks & Brooks, 1996). Technology can support emphasis on big concepts such as marketing (Dixon & Ruetten, 1999), how to rely on primary sources of data such as Civil War research online (Shawhan, 1998). It can also facilitate bringing real life topics such as U.S. Immigration into the classroom (Guhlin, 2000) or help students explore human physiology (Coleman, 1998),

Technology can also assist in the creation and use of electronic portfolios as tools for authentic assessment (Barrett, 2000; Guhlin, 1999). The best use of technology may be that of creating a new teaching and learning environment. Using technology-enhanced problem-based learning approaches encourage students to create standards-based, personally meaningful products.

Problem-based learning is especially effective when supported by educational technology. Problem-based, or project-based, learning supported by educational technology has been shown to raise scores as much as 10% on statewide assessments of reading, mathematics, and writing achievement (Stites, 1999).

Successful Professional Development Strategies for Adult Learners

Structuring professional development that facilitates teachers adoption of technology-enhanced, problem-based learning methods in their classroom may be challenging. Rather than drive-by inservices characterized by lectures, teachers working individually without interaction with a roomful of peers, other approaches exist. One successful approach is the use of cohorts during professional development. A cohort is defined as a group of students who engage in a program of studies together and generally share a common set of experiences (Hresko, 1998). Cohort learning can stimulate critical thinking, enhance conceptual development, encourage mutual interdependence, foster leadership and creative problem-solving skills. It can also help develop interactive social skills and create a strong bond among group members (Dent, 2000). Team learning can be likened to cohort learning in the results it has on collaboration. Team learning emphasizes cooperative planning, supportive relationships, and individual and group performance, allowing team members to apply skills and concepts. Small groups become cohesive and effective due to time spent together, small size, diverse demographics, external threats, and common goals (McCain, 1996).

Yet, learning collaboratively as a cohort or team may not be all positive. Key cautionary points regarding this type of cohort or team learning emerge as follows: (a) adult learners' perspectives concerning who is knowledgeable and the framing of the task can influence the amount of learning which they believe takes place; (b) adult learners may sacrifice learning opportunities to maintain harmony within the group; (c) adult learners' prior experience may inhibit collaborative learning (Harris, 1998). To detour around these potential roadblocks, facilitators must be involved in the development and maintenance of the cohort or team.

In facilitating cohort or team learning environments for teachers, facilitators need to consider several issues; they are as follows: (a) needs assessment of teachers' needs in implementing technology; (b) setting performance goals for cohorts or teams under their leadership; and (c) conducting or facilitating on-going building-based action research.

Planning integration of technology with teaching activities can also be a matter of needs assessment that goes beyond just recognizing teacher's technology weaknesses. It is important to identify teachers' instructional and management needs and how technology can meet those needs. Needs assessments are an important part of providing ongoing support. Needs assessments help us identify problems that are worthy of our training efforts and expenditures. They also help decision-makers allocate limited instructional resources for maximum benefit (Tessmer, McCann, & Ludvigsen, 1999). Effective professional development programs begin with needs assessments. A list of needs assessments can be found online at http://www.edsupport.cc/mguhlin/gallery/edcomp/assessment/index.html. Many of these needs assessments can be used prior to and after educator professional development is initiated. The majority of these needs assessments focus on the same points that SBEC Standards (Appendix A) focus on, which include the use of technology as an information management tool (e.g.

BEST COPY AVAILABLE

graphics, text, video, sound manipulation in the creation of desktop publishing, web site creation, video editing, and others). Particularly effective may be Moersch's (1994) Levels of Technology Implementation (LoTi) scale. This scale identifies the use of technology as an interactive learning medium. Technology as an interactive learning medium, Moersch believes, has the "greatest and lasting impact on classroom pedagogy and is the most difficult to implement and assess." The scale ranges from Level 0 (Non-Use) to Level 6 (Refinement) with Level 4 as the desired level to achieve. At Level 4, technology is perceived as a tool to identify and solve authentic problems as perceived by the students relating to an overall theme/concept. Emphasis is placed on student action, on the resolution of issues requiring higher order thinking skills, in-depth examination of content. Needs assessments such as these can be powerful tools for professional development facilitators, especially as they design cohort learning experiences.

In designing professional development for teachers, and collobarative learning experiences, it is important to identify cohort facilitator responsibilities. These include the following: (a) the instructor selects the team's composition by ensuring that each group has members of both genders; (b) each group has members with approximately equal work experience, educational experience, international experience, and cultural differences; (c) there are a minimum number of subgroups (previously formed relationships); (d) the instructor clearly specifies team goals; (e) the instructor gives the team feedback on their goal accomplishment (individual and group performance evaluation); and (f) The instructor provides resources necessary for high-performance outcomes (Watson as cited in McCain, 1996).

Also critical to effective professional development programs is the use of building-based action research. This building-based approach allows teachers to become action researchers, as they collect data as participant and nonparticipant observers, questionnaires, semistructured

interviews, conversation and critique of self (Melnychuk & Fishburne, 2000; Hobbs, Bullough, Kauchak, Crow, & Stokes, 1998). Action research involves educators in a cyclical process of planning, action, observation and reflection (Sivan, 2000; Towns, Kreke, & Fields, 2000). Hobbs et al. further found that professional development guided by action research allows educators that kept journals to become more reflective about their work, resulting in personal and professional growth. Journals encourage their writers to connect who they are to what they are doing, to integrate personal and professional language, personal and professional judgement (Weisberg & Duffin, 1995). This reflective approach to professional development empowers educators to use and develop knowledge about teaching and learning as powerful as their work requires (Darling-Hammond, 1996; Kirk, 2000).

New Professional Development Strategies

Successful professional development models include designing training that promotes positive and permanent changes in the academic climate of classrooms by influencing teachers' beliefs about their ability to make changes, as well as providing access to instructional materials, educational technologies, and hands-on experiences. Teacher attitudes, time to plan, access, and how professional development is structured are critical to enhancing educators' competencies in technology. An additional factor is continuous learning that allows teachers around the clock access to learning resources rather than seat time during specified hours.

Even as continuous learning is key to teachers becoming competent in the use of technology in their classrooms, teachers need to adapt to the economic and increasingly popular societal use of new staff development models that enhance their learning experience as knowledge architects. A Department of Education report revealed that only 20% of full-time public school teachers feel that they are ready to include education technology or teach culturally

diverse students. However, this does not mean that most teachers are ineffective but that they need continuous professional development (Education Digest, 1999).

Some staff development models that can be used to ensure continuous learning include the following: (a) multimedia presentations through satellites allow educators to communicate in real time with experts and colleagues throughout the world (NEA Today, 1997); (b) electronic journals (Anderson-Inman, 1998); (c) interactive video conferencing sessions for teachers; (d) web-delivered staff developmentincluding streaming video, webcams, and interactive chat (Jackson, March, 1999); and (e) online mailing lists supported by Web-based resources (THE Journal, March, 1999).

These different models are now being used to support the State Board of Educator Certification's (SBEC) technology standards for educators (Appendix A) as well as other initiatives such as the Telecommunications Infrastructure Fund (TIF) Board's training (Kimberly, 2001). An examination of the SBEC standards shows a clear expectation that new staff development models to be used with educators.

On-line teaching, a reactive process, poses challenges for the teachers; teachers react to these challenges by shifting paradigms and using constructivist models (Peterson & Facemyer, 1996). For example, synchronous communication via satellite, streaming video, web cam, or interactive chat are clearly provided for in the SBEC standards, as well as the Technology Applications Texas Essential Knowledge and Skills referred to in those standards. However, teachers must change the way they teach to use these technologies in their classrooms with students.

Texas Public Schools

Uses of technology that meet the SBEC standards in Texas public schools are available in several different districts. Touted by representatives (Rodgers, 2001) from the Texas Center for

Educational Technology (TCET), these districts best exemplify the professional development of teachers in the technology applications:TEKS in Texas public schools. While this review of examples is not exhaustive of all school districts in Texas, as that is beyond the scope of this review, it is important to highlight common components of these school district professional development programs.

Common components of school district professional development programs designed to address educator technology competencies include the following: (a) problem-based learning approaches to guide student learning—both for adults and children; (b) development of technology skills that focus on information seeking, management, synthesis and presentation through a variety of formats (e.g. desktop publishing, web design); and (c) application of these skills in the classroom with students through special summer camps and, later as teachers gain more familiarity, during the school day. This study seeks to review existing educator technology competency development programs that incorporate the components listed above.

Data Collection Methods

Data on different school district educator competency professional development programs were gathered through: (a) Visits to district web pages in an attempt to determine if they had an educator competency development program; (b) Electronic mail to the Texas Center for Educator Technology (TCET) for suggestions of exemplary school districts to review; and, (c) Emailed requests to school districts for their educator competencies. Districts whose educator competencies were available on the web or submitted by email include: Allen ISD, Austin ISD, Carrollton-Farmers Branch ISD, Carroll ISD, Conroe ISD, La Vega ISD, Eanes ISD, Mt. Pleasant ISD, and Northside ISD.

Review of School District Educator Competency Professional Development Programs

The goals of each of the educator competencies professional development programs included the following: developing the technology skills needed for district employees. However, while some districts chose to implement those competencies by developing a professional development program that tracked teachers according to what classes they completed, others chose to track teachers by the products they completed. In this way, the latter districts hoped to measure actual integration of the technology rather than efforts to promote integration. Most efforts were grant-funded, in particular, by the Technology Integration in Education (TIE) and Technology Initiative Challenge grants.

School districts that focus on teacher competency training include Allen ISD, Austin ISD, Carrollton-Farmers Branch ISD, Carroll ISD, Conroe ISD, La Vega ISD, Eanes ISD, Mt. Pleasant ISD, and Northside ISD. Aforementioned districts seek to develop competencies through staff development correlated to International Society for Technology in Education (ISTE) and/or the Technology Applications Texas Essential Knowledge and Skills. All employ traditional staff development delivery approaches (i.e. lecture, inservice drive-bys, etc.). Few (Austin, Carrollton-Farmers Branch, Carroll, Conroe, La Vega, Eanes, Mt. Pleasant, Northside) demonstrate an actual change in the instructional methods used to develop competencies and allow sufficient time for teacher reflection. For these school districts, massive efforts, such as extensive summer staff development in instructional technology, are not evaluated using the frameworks the targeted skills are derived from. Northside ISD has a practicums for basic technology skills (i.e. introduction to Microsoft Word) but does not assess except through required implementation of technology integration projects (also known as Content TIP). These are lessons that are developed during the summer by teachers who integrate technology into

lessons. Then, classroom teachers implement these lessons during the school year. The lessons are "teacher-proof." Teachers can do the lessons without having prior technology experience or training, and a lab aide is available to provide support. With one notable exception, these districts are developing teachers with only a general grasp of any improvement or increase in teachers' technology use.

The exception is Allen ISD. Of the districts reviewed, all recommended by the Texas Center for Educational Technology (TCET), Allen ISD is the only district to take advantage of multiple instructional delivery methods, reflective practices, and evaluation approaches. Funded by a Technology Innovation Challenge Grant, Allen ISD received a nine million dollar grant to develop a program that supports parents, students, and teachers. This approach to online teacher professional development can be found online at http://kids.allenisd.org/ls/. The district seeks to provide instruction in technology integration principles geared toward academic success, as well as provide convenient access to training. The learning theory is clearly constructivist.

Convenient access is facilitated by online databases (i.e. IBM/Lotus' Learning Space) that allows for an interactive learning atmosphere that is both virtual and allows learning at a distance. Although the courses offered are similar to those that the other school districts reviewed offer, these are available completely online and teachers login to Learning Space. This allows their staff development to be tracked in a way much more improved than before, but also, their staff development is correlated to what they need to learn.

Reflective practice allows teachers to work during the summer to develop technology-enhanced lessons, teach those lessons to students, and then reflect on their work. These lessons then serve as lessons that can be used during the school year.

In terms of evaluation, Allen ISD first establishes where its teachers are, and then customizes its technology integration training for them. Products developed by Allen ISD are shared out on the World Wide Web for further use. It not only shares existing, Allen ISD teacher developed lessons, but also provides for links to existing lessons on a wide variety of subjects on the World Wide Web.

For Further Study

Further study needs to be undertaken to assess how all school districts are seeking to develop educator competencies. Most are grant-funded, and it would be interesting to see if a particular grant funded approach to professional development emerges as the most effective, both in terms of results and cost. While Allen ISD boasts of a nine million dollar budget, the other school districts must make do with the district's technology allotment and in-kind funds.

Conclusion

Based on this pilot study, few school districts, even those recommended by the Texas Center for Educational Technology (TCET), truly take advantage of the wide variety of instructional methods available (primarily web-based). Allen ISD presents one district that does make use of instructional methods such as web-based content delivery, interactive databases to assess and track teachers' progression through educator competencies.

References

Barrett, H. (2000, April). Create your own electronic portfolio. Learning & Leading with Technology, 27(7).

Beasley, W., & Sutton, R. (1993). Integration of computers in schools: Three levels of teacher expertise. Journal on Computing in Teacher Education, 9(4), 11-15.

Becker, H. (1998, Winter). Running to catch a moving train: School and information technologies. Theory Into Practice 36 (1), 20-30.

Bowens, E. M. (2000, May). Research, analysis, communication: Meeting standards with technology. Learning & Leading with Technology, 27(8), 6-9, 16-17.

Brooks, J. G., & Brooks, M. G. (1996, July). In search of understanding: The case for constructivist classrooms. Alexandria, VA: ASCD Publications.

Cavalier, J. C., & Klein, J. D. (1998). Effects if cooperative versus individual learning and orienting activities during computer-based instruction. Educational Technology 48 (1), 5.

Chorey, R. M., & McCroskey, J. C. (1999, Winter). The relationship between teacher management communication style and affective learning. Communication Quarterly, 47(1), 1-14.

Coleman, F. (1998, May). I sing the body electronic. Learning & Leading with Technology, 25(8), 18-21.

Darling-Hammond, L. (1996, March). The quiet revolution: Rethinking teacher development. Educational Leadership, 53(6), 4-7.

Dent, E. (2000, February). The unique governance challenges of graduate contract-cohort programs . Journal of Management Education, 24(1), 55-72.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2000). Handbook of qualitative research. London: Sage Publications, Inc..

Dixon, J. K., & Ruetten, M. M. (1999, October). A slice of data. Learning & Leading with Technology, 27(2), 22-27.

Gardener, D. G., Discenza, R., & Dukes, R. L. (1993). The measurement of computer attitudes: An empirical comparison of available scales. Journal of Educational Computing Research, 9(4), 487-507.

George, G., Sleeth, R. G., & Pearce, C. G. (1996, Summer). Technology-assisted instruction and instructor cyberphobia: recognizing the ways to effect change. Education, 116(4), 604-609.

George, G., Sleeth, R. G., & Pearce, C. G. (1996, Summer). Technology-assisted instruction and instructor cyberphobia: recognizing the ways to effect change. Education, 116(4), 604-609.

Greenan, J., Wu, M., Mustapha, R., & Ncube, L. B. (1998, Spring). Attitudes and motivations of vocational teachers regarding program improvement Journal of Industrial Teacher Education [On-Line serial], 35(3). Available http://scholar.lib.vt.edu/ejournals/JITE/v35n3/greenan.html

Guhlin, M. (1999). Electronic portfoliosTechEdge [On-Line serial]. Available http://www.edsupport.cc/mguhlin/articles/portfolios.html

Guhlin, M. (2000, Spring). Five actions to Big6 problem-based lessons [35]. Big6 eNewsletter [On-Line serial], E-1(2). Available http://www.big6.com/enewsletter/archives/spring00/guhlin.html

Harris, M. F. (1998). In their own voices: Adults' perceptions of collaborative learning experiences (Doctoral dissertation, George Washington University, 1998). Dissertation Abstracts International, 59(02A), 0428.

Hobbs, S. F., Bullough, R. V., Kauchak, D. P., Crow, N. A., & Stokes, D. (1998, September-October). Professional development schools: Catalysts for collaboration and change. The Clearing House, 72(1), 47-50.

Hresko, A. P. (1998). A descriptive study of cohort program in educational administrative preparation programs (Doctoral dissertation, Seton Hall University, 1998). Dissertation Abstracts International, 60(01A), 33.

Kimberly, L. (2001, January). Re: TIF Tech via Distance Learning Systems. Available online: http://www.egroups.com/message/tiftechtrainers/148

Kirk, R. (2000, March). A study of the use of a private chat room to increase reflective thinking in pre-service teachers. College Student Journal, 34(1), 115.

Klein, J. D., & Doran, M. S. (1999). Implementing individual and small group learning structures with a computer simulation. Educational Technology 47 (1), 97.

Knezek, G., & Christensen, R. (1997, October). Changes in teacher attitudes during six-Week technology training sessions [On-line]. Technical Report, 96(1), Abstract from: http://www.tcet.unt.edu/research/techrept/tr96-1.htm

Lawton, J., & Gerschner, V. T. (1982). A review of the literature on attitudes towards computers and computerized instruction. Journal of Research and Development in Education, 16(1), 50-55.

Lillard, D. (1985). A survey of Warren County teachers concerning the instructional use of microcomputers. (ERIC Document Reproduction Service No. ED 264 224)

Loyd, B. H., & Gressard, C. P. (1986, Summer). Gender and amount of computer experience of teachers in staff development programs: Effects on computer attitudes and perceptions of the usefulness of computers. AEDS Journal, 302-311.

BEST COPY AVAILABLE

McCain, B. (1996, November). Multicultural team learning: An approach towards communication competency. Management Decision, 34(6), 65-69.

Melnychuk, N., & Fishburne, G. (2000, March). Physical education preservice teachers' action research: professional development workshops. Research Quarterly for Exercise and Sport, 71(1), A-78.

Moersch, C. (1994). The levels of technology implementation framework. [On-line]. Available from: http://www.learning-quest.com/LoTi/

Nicaise, M., & Crane, M. (1999). Knowledge constructing through hypermedia authoring. Educational Technology 47 (1), 29.

Niederhauser, D. S. (1996, October). Using information in an information age classroom: What teachers need to know. NAASP Bulletin, 80(582), 71-81.

Parish, T. S., & Necessary, J. R. (1996, Summer). An examination of cognitive dissonance and computer attitudes. Education, 116(4), 565-567.

Parish, T. S., & Necessary, J. R. (1996, Summer). An examination of cognitive dissonance and computer attitudes. Education, 116(4), 565-567.

Peterson, N. S., & Facemyer, K. (1996, October). The impact of the internet on learners and schools. NAASP Bulletin, 80(582), 53-59.

Rodgers, B. (2001, January). Re: Educator Competencies. Available: email received.

Shaver, J. P. (1998). Electronic technology and the future of social studies in elementary and secondary schools. Paper presented at SSEC, .

Shawhan, J. P. (1998, May). The civil war online: Using the internet to teach U.S. history. Learning & Leading with Technology, 25(8), 22-27.

Sivan, A. (2000, July). The implementation of peer assessment: An action research approach . Assessment in Education, 7(2), 193.

Stites, R. (1999). What does research say about outcomes from project-based learning? The Challenge 2000 Multimedia Project. Retrieved September 13, 1999 from the World Wide Web: http://pblmm.k12.ca.us/PBLGuide/pblresch.htm.

Summers, M. (1990). New student teachers and computers: An investigation of experiences and feelings. Educational Review, 42(3), 261-271.

Summers, M. (1990). New student teachers and computers: An investigation of experiences and feelings. Educational Review, 42(3), 261-271.

Tessmer, M., McCann, D., & Ludvigsen, M. (1999). Reassessing training programs: A model for identifying training excesses and deficiencies. Educational Technology 47 (2), 86.

Towns, M. H., Kreke, K., & Fields, A. (2000, January). An action research project: Student perspectives on small-group learning in chemistry . Journal of Chemical Education, 77(1), 111-115.

Weisberg, M., & Duffin, J. (1995, January-February). Evoking the moral imagination: Using stories to teach ethics and professionalism to nursing, medical, and law students. Change, 27(1), 20-28.

Young, A. C., Reiser, R. A., & Dick, W. (1999). Do superior teachers employ systematic instructional planning procedures? A descriptive study. Educational Technology 46 (2), 65.

Appendix A

SBEC's Standards for Teachers

Standard I. All teachers use technology-related terms, concepts, data input strategies, and ethical practices to make informed decisions about current technologies and their applications.

Standard II. All teachers identify task requirements, apply search strategies, and use current technology to efficiently acquire, analyze, and evaluate a variety of electronic information.

Standard III. All teache rs use task-appropriate tools to synthesize knowledge, create and modify solutions, and evaluate results in a way that supports the work of individuals and groups in problem-solving situations.

Standard IV. All teachers communicate information in different formats and for diverse audiences.

Standard V. All teachers know how to plan, organize, deliver, and evaluate instruction for all students that incorporates the effective use of current technology for teaching and integrating the Technology Applications Texas Essential Knowledge and Skills (TEKS) into the curriculum.

Standard VI. The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in computer science, in addition to the content described in Technology Applications Standards I–V.

Standard VII. The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in desktop publishing, in addition to the content described in Technology Applications Standards I–V.

Standard VIII. The digital graphics/animation teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in digital graphics/animation, in addition to the content described in Technology Applications Standards I–V.

Standard IX. The multimedia teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in multimedia, in addition to the content described in Technology Applications Standards I–V.

Standard X. The video technology teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in video technology, in addition to the content described in Technology Applications Standards I–V.

Standard XI. The Web mastering teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems, and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in Web mastering, in addition to the content described in Technology Applications Standards I–V.

Appendix B

Rubric

	Advanced (4-5)	**Intermediate (2-3)**	**Beginning (0-1)**	**Score**
Learning Theory	Integrates problem-based learning, constructivist approaches, androgogy and technology into the instructional design	Makes an attempt to connect constructivism, problem-based learning approaches, and technology, to curriculum projects.	Makes little or no attempt at integrating current learning theory, technology into the curriculum.	
Instructional Methods & Training Delivery	Takes full advantage of technologies such as interactive, synchronous video chat, web-based tools such as streaming video, webcams, online mailing lists	Uses technologies to supplement content delivery but is not the primary means of content delivery.	Refers to technologies in instructional materials yet it is seldom employed.	
Correlation to Educator Competencies	Correlates to the educator competencies established by the SBEC and TA:TEKS for 8th grade.	Correlates to the Technology Application: TEKS but makes no mention of the SBEC Standards.	Focuses on just teaching technology skills.	
Time for Implementation	Allows for ample time to provide staff development, reflection, and implementation of new strategies.	Limits time to just summer computer camp, with no reflective practices built-in or designed.	Implementation of new strategies is up to the teachers to do on their own.	
Evaluation Standards	Provides for several forms of evaluation, such as the LOTI and evaluation directly influences professional development offered to teachers.	Evaluation form is in place, however, it is not connected to professional development efforts for teachers.	No evaluation is evident.	

BEST COPY AVAILABLE

Appendix C

Educator Competencies Web Site

http://www.edsupport.cc/mguhlin/gallery/edcomp/

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE
(Specific Document)

ERIC Educational Resources Information Center

I. DOCUMENT IDENTIFICATION:

Title:	Methods that Work: Educator Competencies for Technology in Texas Public Schools	
Authors:	Miguel Guhlin Leo Omelas Dr. Richard Diem	
Corporate Source:	Publication Date:	April 2002

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, Resources in Education (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options below and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents	The sample sticker shown below will be affixed to all Level 2A documents	The sample sticker shown below will be affixed to all Level 2B documents
PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY SAMPLE TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY HAS BEEN GRANTED BY SAMPLE TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY SAMPLE TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
Level 1	Level 2A	Level 2B
◉	○	○
Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) and paper copy.	Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only.	Check here for Level 2B release, permitting reproduction and dissemination in microfiche only.
Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.		

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Signature: J M Guhlin	Printed Name/Position/Title: Juan Miguel Guhlin/Administrator/PAVE	
Organization/Address: 5330 Stormy Dawn Univ. of Texas at San Antonio San Antonio, Texas, USA 78247	Telephone: 210-241-8544	FAX: 210-522-8167
	E-mail Address: mguhlin@yahoo.com	Date: 4/14/02

EFF-088 (Rev. 2/2001)